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WRITER'S DIRECT DIAL NUMBER

202-429-7338

William F. Caton
Acting Secretary
Federal Communications Commission
Room 222
1919 M Street, N.W.
Washington D.C. 20054

In Re: **Ex Parte Presentation in PR Docket No. 93-60 (Co-channel Protection Criteria for Part 90, Subpart S Stations Operating Above 800 MHz)**

Dear Mr. Caton:

On August 2nd, 1993, representatives from Motorola Inc., Industrial Telecommunications Association (ITA), American Mobile Telecommunications Association (AMTA), and the National Association of Business and Educational Radio (NABER) -- hereinafter the Joint Commenters -- met with various representatives of the Private Radio Bureau and the Office of Engineering and Technology to discuss the comments filed in the above referenced proceeding.

Participating in the meeting were PRB staff members Ron Netro, Ed Jacobs, Rosalind Allen, Marty Liebman and Eugene Thompson. William Daniels of OET also attended. Representing the Joint Comenters were myself, Janet Ernest, Bob Fleissner, Alan Tilles, Lynn Mallonee, Fred Day and Klauss Bender.

The meeting focused on the Comments and Reply Comments submitted by the Joint Commenters in this proceeding. In addition, the attached paper summarizing the position of the Joint Commenters was distributed at the meeting.

Please call me at (202) 429-7338 should you have any questions on this matter.

Sincerely,

Michael A. Lewis

Michael A. Lewis
Engineering Consultant

cc: All Participants

Ex Parte Presentation on

CO-CHANNEL PROTECTION CRITERIA

PR Docket No. 93-60

August 2, 1993

by

Motorola, Inc.
Industrial Telecommunications Association
American Mobile Telecommunications Association
National Association of Business and Educational Radio

THE JOINT COMMENTERS

CO-CHANNEL PROTECTION - OVERVIEW

- Docket 18262 defines protection criteria for PLMR stations above 800 MHz.
  - 40 dBμ signal needed for reliable service.
  - 10 dB buffer adopted -- *i.e.*, 40/30 dBμ protection.
  - Using the R-6602 curves and 12 dB for urban clutter, FCC adopts a 70 mile separation requirement for most SMR stations.
- Revised criteria adopted for SMRs in PR Docket No. 90-34.
  - 70 miles separation remains the standard.
  - Lesser separations are allowed through a table providing 40/22 dBμ protection.
  - Table considers directional HAAT; provides one-way protection; and assumes that all existing stations are operating at maximum permitted facilities.
- Current proceeding is considering modified criteria for all 800 MHz PLMR services.
  - Proposal is derivative of past FCC engineering analysis.
  - Provides 40/22 dBμ protection but considers actual operating parameters of existing stations.
  - 50 mile limit on co-channel spacings.

JOINT COMMENTERS' PROPOSAL

- The Joint Commenters fully support the need to revisit protection criteria for PLMR stations operating above 800 MHz.
  - ▸ Each Joint Commenter has previously supported increasing protection to 40/22 dBμ.
  - ▸ The Joint Commenters believe that the FCC's proposal is superior to existing policies.
  - ▸ The Joint Commenters seek minor modifications to FCC methodology that will ensure adequate protection at spacings much less than 70 miles.
- The R-6602 F(50,10) curve is not accurate at shorter distances.
  - ▸ R-6602 Report developed for high powered broadcast services. Few, if any, data points were less than 40 miles from the transmitter location.
  - ▸ R-6602 used receivers 30 feet above ground. A 9 dB adjustment is insufficient when considering mobile receive antenna heights of 6 feet.
  - ▸ Most importantly, Figure 26 from R-6602 shows little, if any difference between F(50,10) and F(50,50) at distances less than 35 miles. *See* attached Figure 26 and Table A.
- Joint Commenters proposed solution would replace the F(50,10) curve with the F(50,50) curve, reduced by 12 dB, when calculating the distance to the interference contour.

JOINT COMMENTERS' PROPOSAL

- The Joint Commenters' proposed protection criteria is derived from past FCC policies.
  - Basic underpinning is a 20 mile service area and the standard 70 mile separation.
  - 70 miles yields a 30 dB C/I ratio (approximately) using the F(50,50) to calculate both the service and interference IX contours.
  - The Joint Commenters' table provides a 30 dB protection ratio.
- Key aspects of the Joint Commenters' proposal:
  - Provides bi-directional protection: FCC only provides protection to existing station.
  - Considers actual operating parameters of the existing station; considers directional HAAT.
  - Proposes a 50 mile minimum separation distance.
- The Joint Commenters only wish to provide adequate protection to all systems. The proposal is not intended to shut the spectrum door to new entrants.
  - Little difference at spacings approaching 70 miles.
  - Allows alternative studies that rely on real engineering to support spacings that are not in conformance with the table.

OTHER ISSUES

- High Antenna sites.
  - ▸ FCC already provides greater protection in some areas, the Joint Commenters' proposal addresses other regions with high sites.
  - ▸ FCC's table max's out at 1000 feet; inadequate for mountainous regions.
  - ▸ Admittedly, solution will need to balance technical assignment issues with administrative impact.
    - ▸ *Preferred Solution:* From a technical perspective, the Joint Commenters believe that Method 2, the DHAAT/Linear Method, best balances the goals of accuracy and administrative convenience.
- Mexican Offset Channels:
  - ▸ 800 MHz channels in the Mexican border area are 12.5 kHz offset from non-border area channels. FCC considers offsets adjacent channel operations.
  - ▸ Offsetting the carriers does provide FM signals with some protection. This protection would not be attained by digital systems (*i.e.*, multi-slot TDMA)
  - ▸ Offsets should be considered co-channel and abide by the proposed protection tables.
  - ▸ Alternatively, an offset channel table could be derived based on the protection afforded to FM analog signals.

SAMPLE CALCULATION

- Existing station = 500 watts ERP at 500 feet HAAT
  - Distance to 40 dBμ [f(50,50)] is 20.9 miles
  - Distance to 10 dBμ [f(50,50)] is 48.5 miles
- Proposed station = 62 watts ERP at 175 feet HAAT
  - Distance to 40 dBμ [f(50,50)] is 7.8 miles
  - Distance to 10 dBμ [f(50,50)] is 31.1 miles
- Required separations is caluclated by adding the distance to the 40 dBμ contour of one station to the distance to the 10 dBμ contour of the other. The greater separation determines the permissibility of the assignment.
  - Case 1: 20.9 miles + 31.1 miles = 52.0 miles
  - Case 2: 7.8 miles + 48.5 miles = 56.3 miles
- These two stations would need to be separated by 56 miles. FCC proposal would require 51.5 mile separation.

TABLE A

Comparison Analysis
Predicted Field Strength Distances
f(50,10) versus f(50,50)

175 feet at 62 watts

Distance (MI)	f(50,50) (dBu)	f(50,10) (dbu)	f(50,10)-f(50,50)
5	47.7	47.7	0.1 dB
10	35.8	36.0	0.2 dB
15	29.2	29.9	0.7 dB
20	23.0	24.6	1.6 dB

175 feet at 125 watts

Distance (MI)	f(50,50) (dBu)	f(50,10) (dbu)	f(50,10)-f(50,50)
5	50.8	50.8	0.0 dB
10	38.8	39.1	0.3 dB
15	32.2	33.0	0.8 dB
20	26.1	27.7	1.6 dB

All field strength figures reduced by 9 dB to correct for 6 foot mobile antenna height.

TABLE B

Comparison Analysis
Interfering Contour Distances
f(50,10) versus f(50,50)

Power (W)->		62	125	250	500	1000
DHAAT		Contour Range in Miles				
175	A	22.8	26.3	30.4	35.2	41.7
	B	29.4	32.0	34.8	37.7	40.8
	C	31.1	33.8	36.7	39.7	43.4
250	A	25.5	29.2	33.2	38.0	44.5
	B	32.0	34.7	37.5	40.4	43.8
	C	33.8	36.5	39.4	42.6	46.6
350	A	28.6	32.3	36.2	41.1	47.7
	B	34.7	37.4	40.2	43.2	46.8
	C	36.5	39.2	42.1	45.5	49.8
500	A	31.9	35.4	39.2	44.3	52.2
	B	37.2	39.9	42.7	45.9	49.9
	C	39.0	41.7	44.8	48.5	53.2
700	A	34.9	38.4	42.8	49.1	56.5
	B	39.9	42.8	45.9	49.6	54.2
	C	41.8	44.8	48.2	52.5	57.9
1000	A	39.1	43.7	49.4	55.5	62.5
	B	44.3	47.8	51.7	56.2	61.2
	C	45.6	50.4	54.6	59.5	64.6

Key:

A: 22 dBu f(50,10) contour range (no correction)
B: 12 dBu f(50,50) contour range (10 dB correction factor)
C: 10 dBu f(50,50) contour range (12 dB correction factor)

All contour adjusted by 9 dB for 6 foot mobile antenna